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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/993,266	11/19/2001	Robert-Christian Hagen	MAS-FIN-141	6384

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EXAMINER

FARAHANI, DANA

ART UNIT PAPER NUMBER

2814

DATE MAILED: 09/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/993,266

Applicant(s)

HAGEN ET AL.

Examiner

Dana Farahani

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 13-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election without traverse of claims 1-12 in Paper No. 9 is acknowledged.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 5, 6, and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cambou (U.S. Patent 5,283,454) in view of Baba (U.S. Patent 6,317,333).

Regarding claims 1 and 5, Cambou discloses in figure 1, an electronic component comprising a semiconductor chip 16 having a semiconductor substrate (the same as the chip) with an active upper side, on the top where there are electronic components 30, and a passive rear side on the bottom, having a surface area; at least one lead D disposed within the substrate; a buried layer 14 being electrically conductive and having a surface area corresponding in size to the surface area of the passive rear side, the buried layer disposed within the substrate in a region of the passive rear side and connected to the lead; and conductive annular layer contacts 20 disposed on the upper side of the semiconductor substrate.

Cambou does not disclose the lead being a ground lead.

Baba discloses in figure 2, and column 7, lines 10-15, external connection 5c of chip 2 is grounded. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to ground the lead in Cambou's invention in order to establish a voltage reference for the chip structure.

Regarding claims 2 and 6, Cambou discloses layer 14 of figure 1 has a very low resistivity and could be silicide (see column 2, line 44-51). Although, Cambou does not expressly disclose the impurity concentrations of the layer, and contacts 20, are over  $10^{20} \text{ cm}^{-3}$ , it would have been obvious to one of ordinary skill in the art at the time the invention was made to make layer 14 and contacts 20 with a high concentration, so they would have had very low resistances.

Regarding claim 3, see column 4, lines 57-65, wherein is stated the wafer of the device in the invention is silicon.

Regarding claims 9 and 10, Cambou discloses the chip contacts 20, but does not disclose the external contacts to contacts 20 are solder balls mounted to a mounting circuit board.

Baba discloses in figure 2 circuit board 1, and that the contact bumps of chip 2 are solder balls 5. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use solder balls as contacts for the chip, mounted on a circuit board, in Cambou's invention in order to make external distinct contacts to outside circuitry of the chip and to physically support the chip.

Regarding claims 11 and 12, Cambou discloses the chip contacts 20, but does not disclose a wiring foil on top of the chip.

Baba discloses in figure 2 wiring foil 1b with connecting lines (darker areas inside) connecting the solder ball contacts of chip 2 to output contact areas on the bottom part of the foil, and solder ball 5c is grounded (column 7, lines 10-15). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make such an arrangement in order to build the device in Baba's invention, which has high reliability when thermal stress is generated (see column 2, lines 11-15).

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cambou in view of Baba as applied to claim 1 above, and further in view of Gris et al., hereinafter Gris (U.S. Patent 4,561,932).

Cambou in view of Baba renders obvious the claimed invention, as above discussed, except for a mono-crystalline silicon substrate.

Gris discloses a mono-crystalline substrate (see the abstract). Gris also discloses that the mono-crystalline substrate allows forming dielectrically isolated islets in the substrate, simply and inexpensively (see column 1, lines 46-53). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a mono-crystalline substrate in order to be able to form isolated electronic device components in the substrate.

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cambou in view of Baba as applied to claim 1 above, and further in view of Wyland et al. hereinafter Wyland (U.S. Patent 5,962,924).

Cambou in view of Baba renders obvious the claimed invention, as above discussed, except for the electronic component (chip) being a component of a flip-chip mounting technique.

Wyland discloses that flip-chip technology maximize a circuit density and signal speed (see column 1, lines 35-39). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the chip in Cambou's invention to increase the circuit density and signal speed.

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cambou in view of Baba as applied to claim 1 above, and further in view of Larson et al., hereinafter Larson (U.S. Patent 6,109,530).

Cambou in view of Baba renders obvious the claimed invention, as above discussed, except for the electronic component (chip) of claim 1 being a radio-frequency component.

Larson discloses that chips and chip packages are used in conventional radio-frequency technology (see column 1, lines 33-37). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the chip in Cambou's invention as a radio-frequency component since chips are used in conventional radio-frequency devices.


**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (703)305-1914. The examiner can normally be reached on M-F 8:00AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703)306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9318 for regular communications and (703)872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Dana Farahani  
September 15, 2002

  
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